REMARKS

Applicants graciously acknowledge the telephone interview with the Examiner conducted on September 3, 2004. With this paper, Applicants have attempted to address the issues discussed during the interview.

Applicants have studied the Office Action dated July 21, 2004, and have made amendments to the claims. Claims 1, 18, 33 and 38 have been amended. Claims 1-40 are pending. Claims 1, 18, 33 and 38 are independent claims. No new matter has been entered. It is submitted that the application, as amended, is in condition for allowance. Reconsideration and reexamination are respectfully requested.

Information Disclosure Statement

In the Office action, the Examiner indicated that the listing of references in the specification is not a proper information disclosure statement. In the telephonic interview conducted on September 3, 2004, it was respectfully submitted that the listing of references on page 2 of the specification was intended to incorporate by reference the contents of two co-pending applications and was not intended to be an information disclosure statement. It was further respectfully submitted in the interview that an information disclosure statement conforming to the requirements of 37 CFR 1.98(b) was submitted with the application.

As per the Examiner's suggestion during the telephonic interview conducted on September 3, 2004, a copy of the IDS and form PTO-1449 is attached with a copy of the return postcard from the USPTO indicating receipt of the information disclosure statement on August 20, 2004. It is believed that no fee is due with respect to the IDS since the IDS was originally submitted before the first Office action on the merits was issued. Applicant respectfully requests that the Examiner consider the references cited in the IDS and return form PTO-1449 with the proper indication that the references have been considered.

Amendments to Specification

With this paper, the specification has been amended at page 2 to provide more detailed information regarding the co-pending patent applications which are incorporated by reference in the present application. The amendment is not related to the patentability of the application.

§ 103 Rejections

Claims 1-40 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Citta et al. (U.S. Patent No. 5,602,595) in view of Fimoff et al. (U.S. Patent No. 5,563,884). Applicant respectfully disagrees with the Examiner's interpretation of Citta et al. and the rejection is respectfully traversed.

It is respectfully noted that the Federal Circuit has provided that an Examiner must establish a case of prima facie obviousness. Otherwise the rejection is incorrect and must be overturned. As the court stated in In re Rijkaert, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993): "In rejecting claims under 35 U.S.C. § 103, the examiner bears the initial burden of presenting a prima facie case of obviousness. Only if that burden is met, does the burden of coming forward with evidence or argument shift to the applicant. 'A prima facie case of obviousness is established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art.' If the examiner fails to establish a prima facie case, the rejection is improper and will be overturned." (Citations omitted.)

In the Office action at paragraph 3, the Examiner asserts that Citta et al. discloses a header inserter "for inserting a header to the supplemental data" and a multiplexer for multiplexing the MPEG data and the "supplemental data having the header inserted thereto." The Examiner refers to FIG. 3 of Citta et al. as disclosing the header inserter and to elements 16 and 24 of FIG. 2 as disclosing the multiplexer. Since the Examiner has not specifically identified which elements of Citta et al. are analogous to the "MPEG data" and the "supplemental data" recited in independent claims 1, 18 and 33 of the present application, Applicant has made certain assumptions as identified in the following remarks.

Discussion of Citta et al. FIG. 2 and Analogy to Elements of Present Claims

With regard to the Examiner's assertion that elements 16 and 24 in FIG. 2 of Citta et al. disclose a multiplexer for multiplexing the MPEG data and the "supplemental data having the header inserted thereto," it is respectfully noted that the MPEG transport multiplexer 16 is supplied with the "an ATV signal source 10" that "is coupled to an MPEG video compressor 12 and to an audio compressor 14" as well as "with the output of an auxiliary data source 13," where the "outputs of MPEG video compressor 12 and audio compressor 14 are... complete with their own headers." Citta et al. at col. 2, ll. 50-54. It is further respectfully noted that that multiplexer 24 is supplied with an MPEG signal that is the output of MPEG transport multiplexer 16 having had the MPEG sync byte removed in MPEG sync byte remover 18 and the resultant MPEG signal being encoded and processed as multilevel symbols in block 20 and that

multiplexer 24 is also supplied with data segment sync (DSS) and field sync (FS) signals from sync generator 22. See Citta et al. at col. 2, line 59 to col. 3, line 13.

The Examiner is asserting that the outputs of the MPEG video compressor 12 and audio compressor 14 and the output of block 20 disclosed in Citta et al. are analogous to the MPEG data recited in independent claims 1, 18 and 33 of the present application. It is further respectfully submitted that the Examiner is asserting that the output of the auxiliary data source 13 and the sync (DSS) and field sync (FS) signals from a sync generator 22 disclosed in Citta et al. are analogous to the supplemental data recited in independent claims 1, 18 and 33 of the present application. Moreover, it is respectfully noted that nowhere in Citta et al. is it disclosed that that the supplemental data (i.e. the outputs of the "auxiliary data source 13" and the "sync (DSS) and field sync (FS) signals from a sync generator 22") have a header inserted thereto.

Therefore, it is respectfully submitted that Citta et al. does not disclose a multiplexer for multiplexing the MPEG data signal and the supplemental data signal having the header inserted thereto, as recited in independent claims 1 and 18 of the present application. Rather, it is respectfully submitted that Citta et al. discloses a multiplexer 16 for multiplexing MPEG data that has a header (i.e. the outputs of the "MPEG video compressor 12 and audio compressor 14") and supplemental data that has **no header** (i.e. the output of the "auxiliary data source 13") and discloses a multiplexer 24 for multiplexing MPEG data that has a header (i.e. the output of "block 20") and supplemental data that has **no header** (i.e. "the sync (DSS) and field sync (FS) signals from a sync generator 22") where the MPEG data that has a header is a combination of MPEG data that has a header and supplemental data that has **no header** (i.e. "output of multiplexer 16").

Discussion of Citta et al. FIG. 3

With regard to the Examiner's assertion that FIG. 3 of Citta et al. discloses a header inserter "for inserting a header to the supplemental data," it is respectfully noted that FIG. 3A of Citta et al. "illustrates a conventional MPEG transport packet which consists of 188 bytes including a 4 byte header...with the first byte of the header being the MPEG sync byte" and FIG. 3B of Citta et al. illustrates "the MPEG transport packet of FIG. 3A...with the MPEG sync byte removed." Citta et al. at col. 3, ll. 20-27. It is respectfully submitted that neither FIG. 3A nor FIG. 3B of Citta et al. disclose a "header inserter" as neither figure discloses an apparatus of any kind, but rather that the figures disclose timing diagrams of signals generated by the Citta et al. apparatus disclosed in FIG. 2.

Further, with regard to the Examiner's assertion that FIG. 3 of Citta et al. discloses a header inserter "for inserting a header to the supplemental data," it is respectfully noted that

Citta et al. discloses that "[t]he outputs of MPEG video compressor 12 and audio compressor 14 are packetized elementary data streams (PES)...complete with their own headers" and that in "the MPEG transport multiplexer 16, the PES signals and auxiliary data are formatted into fixed length MPEG data transport packets of 188 bytes, including a 4 byte header having a 1 byte MPEG sync." Citta et al. at col. 2, ll. 53-62. In view of the noted disclosure in Citta et al., it is respectfully submitted that FIG. 3A illustrates the signal that is output from the MPEG transport multiplexer 16 illustrated in FIG. 2.

Moreover, with regard to the Examiner's assertion that FIG. 3 of Citta et al. discloses a header inserter "for inserting a header to the supplemental data," it is respectfully noted that Citta et al. discloses that the "multiplexed compressed transport signals are supplied to a block 18 labeled MPEG sync byte remover where the MPEG sync byte is removed from each MPEG transport packet." Citta et al. at col. 2, ll. 62-66. In view of the noted disclosure in Citta et al., it is respectfully submitted that FIG. 3B illustrates the signal that is output from the MPEG sync byte remover 18 illustrated in FIG. 2.

Therefore, it is respectfully submitted that FIG. 3A and 3B of Citta et al. do not illustrate the output signals from a header inserter for inserting a header to the supplemental data, as recited in independent claims 1 and 18 of the present application or adding an MPEG header of preset bytes to each one of the supplemental packets, as recited in independent claim 33 of the present application. It is further respectfully submitted that, if there is any "header inserter" disclosed in Citta et al. at all, it is contained in the "video compressor 12" and "audio compressor 14," given that the PES outputs from these devices are "complete with their own headers." Moreover, in view of the previous remarks with regard to the analogy between the elements of Citta et al. and the elements of the claims of the present application, it is respectfully submitted that any "header inserter" disclosed in Citta et al. is not a header inserter for inserting a header to the supplemental data or adding an MPEG header of preset bytes to each one of the supplemental packets, but rather a "header inserter" for inserting a header to **only** "the MPEG data."

Amendment to Independent claim 38

With this paper, independent claim 38 has been amended to recite a supplemental data region comprising a header added thereto. Support for the amendment is found in the application as originally filed. In view of the previous remarks, it is respectfully submitted that Citta et al. does not disclose a signal format comprising a supplemental data region comprising a header added thereto.

Significance of the Supplemental Data Header

The header that is added to the supplemental data by the apparatus and methods of the present invention is significant in that it allows the supplemental data to be transmitted on the same channel as the MPEG video and audio data without any adverse influence on the existing receivers that are equipped to receive ATSC VSB digital broadcasting. See specification at page 7, ll. 18-20. With only a header added to the combination of the MPEG data and supplemental data, as in the Citta et al. invention, the supplemental data may not be discarded at the MPEG decoder of the legacy receiver. See specification at page 13, ll. 25-29. It is respectfully submitted that the structure reacted in independent claims 1, 18 and 33 of the present application and the structure disclosed in Citta et al. are patentably different.

Amendments to Independent Claims 1, 18 and 33

Although applicants respectfully disagree with the Examiner's interpretation of Citta et al., independent claims 1, 18 and 33 have been amended to further distinguish these claims from Citta et al. by reciting that the VSB supplemental data processor is configured to preprocess the supplemental data signal, or the auxiliary data signal, as opposed to the MPEG audio/visual signal. It is respectfully submitted that Citta et al. fails to disclose this limitation.

It is respectfully noted that the Examiner argues that a forward error correction coder for coding the supplemental data signal recited in claims 1, 18 and 33 corresponds to the FEC shown in FIG 1 of Citta et al. (as a result of FEC coder). Applicants respectfully disagree with the Examiner's interpretation of Citta et al.

It is further respectfully noted that the VSB supplemental data processor recited in claims 1, 18 and 33 is configured to preprocess the supplemental data signal, not the MPEG audio/video signal, and this is one of the essential features of the VSB transmitter recited in claims 1, 18 and 33 for enhancing the noise-rebustness of only the supplemental data. Therefore, all the components included in the VSB supplemental data processor of claims 1, 18 and 33 process only the supplemental data, not the audio/video signal. For example, the forward error correction coder recited in claim 1 codes the supplemental data signal only, not the MPEG data signal. This patentable feature is clearly shown in FIG. 2 of the present application.

However, Citta et al. fails to teach or suggest that the VSB supplemental data processor preprocesses the supplemental data signal, as recited in claims 1, 18 and 33. More particularly, Citta et al. fails to teach or suggest the forward error correction coder recited in claims 1, 18 and 33.

For example, Citta et al. clearly states that the audio/video PES signals and auxiliary data are formatted into fixed length MPEG data transport packets in the MPEG transport multiplexer 16 shown in FIG. 2 (column 2, lines 59-62) and that the sync generator 22 adds DSS and FS to the encoded symbols for providing an output at multiplexer 24 having the format shown in FIG. 1 (column 3, lines 9-14). The multiplexer 16 multiplexes video and audio PES with the auxiliary data, and subsequently, the block 20 performs FEC coding on the multiplexed data. Therefore, Citta et al. fails to teach or suggest a FEC coder coding the supplemental data only, and also fails to teach or suggest a VSB supplemental data processor preprocessing only the supplemental data signal.

It is respectfully noted that the Examiner asserts that Citta et al. teaches the multiplexer recited in claims 1, 18 and 33. However, it is respectfully submitted that the supplemental data multiplexed by the multiplexer of claims 1, 18 and 33 is preprocessed by the VSB supplemental data processor and this preprocessing feature is not taught by Citta et al. Referring to FIG. 2 of Citta et al., the auxiliary data from the AUX DATA source 13 is directly multiplexed with the video and audio PES by the multiplexer 16 without being preprocessed. Therefore, it is further respectfully submitted that Citta et al. fails to teach or suggest all the limitations of claims 1, 18 and 33.

Discussion of Fimoff et al.

It is respectfully submitted that Fimoff et al. fails to cure the defects previously submitted with regard to Citta et al. as applied to independent claims 1, 18, 33 and 38.

It is further respectfully noted that the Examiner asserts that Fimoff et al. teaches inserting a null sequence to the supplemental data. As previously submitted, a key feature of the VSB transmitter claims in claims 1, 18 and 33 is that the VSB supplemental data processor preprocesses only the supplemental data signal. In particular, the null sequence inserter of claims 1, 18 and 33 inserts a plurality of null bits into the FEC processed supplemental data signal only, not the audio/video signal. By inserting the null bits, the noise robustness (lower error rate) of the supplemental data is enhanced.

It is further respectfully submitted that Fimoff et al. does not teach a null sequence inserter for inserting a plurality of null bits into only the FEC coded supplemental data signal. Fimoff et al. teaches inserting null packets merely for filling or padding, but there is no suggestion or motivation to combine Fimoff et al and Citta et al. to teach a null sequence inserter inserting null bits into the supplemental data signal for enhancing the noise rebustness (or lowering the error rate) of the supplemental data.

In view of the previous remarks, it is respectfully asserted that the Examiner has failed to establish the requisite prima facie case of obviousness with respect to several different elements of independent claims 1, 18, 33 and 38. First, the cited references do not disclose a multiplexer for multiplexing the MPEG data signal and the supplemental data signal having the header inserted thereto or a header inserter for inserting a header to the supplemental data as recited in independent claims 1 and 18. Second, the cited references do not disclose adding an MPEG header of preset bytes to each one of the supplemental packets, as recited in independent claim 33. Third, the cited references do not disclose a supplemental data region comprising a header added thereto, as recited in independent claim 38. Fourth, the cited references do not disclose a VSB supplemental data processor configured to preprocess the supplemental data signal, as recited in independent claims 1, 18 and 33. Fifth, the cited references do not disclose a null sequence inserter for inserting a plurality of null bits into only the supplemental data signal, as recited by independent claims 1, 18 and 33.

Therefore, it is respectfully asserted that independent claims 1, 18, 33 and 38 are allowable over the cited references. It is further respectfully asserted that claims 2-17, which depend from claim 1, claims 19-32, which depend from claim 18, claims 19-32, which depend from claim 18, claims 34 to 37, which depend from claim 33, and claims 39 and 40, which depend from claim 38, also are allowable over the cited references.

CONCLUSION

In light of the above remarks, Applicant submits that claims 1-40 of the present application are in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

U.S. Patent Nos. 5,184,921 to Limberg, 5,087,975 to Citta et al., 6,724,832 B1 to Hershberger, 6,763,025 B2 to Leatherbury et al., and 5,923,711 to Willming have been cited as having been made of record and not relied upon. Applicant has reviewed the cited references and believes that the claims of the present invention are allowable over the cited references individually or in combination with the other cited references.

Furthermore, U.S. Patent No. 6,760,077 B2 to Choi et al. has been cited as having been made of record and not relied upon. It is respectfully noted that this reference is the Applicant's own patent application which was filed on the same date as the present application and, therefore, is not a valid prior art reference with respect to the present application.

No amendment made was related to the statutory requirements of patentability unless expressly stated herein; and no amendment made was for the purpose of narrowing the scope of any claim, unless Applicant has argued herein that such amendment was made to distinguish over a particular reference or combination of references.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California, telephone number (213) 623-2221 to discuss the steps necessary for placing the application in condition for allowance.

Respectfully submitted,

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